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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,503	10/13/2004	Erich Gornik	CU-3859 RJS	5922
26530	7590	10/10/2006	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604			LEE, HWA S	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/502,503	Applicant(s) GORNIK ET AL.	
	Examiner Andrew Hwa S. Lee	Art Unit 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>10/13, 12/17/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. Multiple limitations lack antecedent basis. The examiner suggests all the claims be reviewed for proper antecedent basis, replacement of pronouns such as “its,” and proper use of current U.S. practice for mathematical equation (i.e. 2Ln rather than 2.L.n). Below are at least some of the clarity issues.

Claim 1 recites a “the light beam reflected” in line 8 and lacks antecedent basis. Earlier in the claim, the light beam is split into a reference beam and a sample beam, thus the light beam no longer exists so it is unclear the light beam can be reflected. In addition, “the reflected reference beam” lacks antecedent basis. Clarification is needed to define the relationships between the “backside” and the “topside” of the semiconductor.

Claim 4 is unclear with the use of “at least one light beam.” Is that referring to the light beam recited in claim 1?

Claim 13 and 31 recite “preferably” and “e.g.” and are thus indefinite.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 1-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims are directed to a judicial exception; as such, pursuant to the Interim Guidelines on Patent Eligible Subject Matter (MPEP 2106)), the claims must have either physical transformation and/or a useful, concrete and tangible result. The claims fail to include transformation from one physical state to another. Although, the claims appear useful and concrete, there does not appear to be a tangible result claimed. Merely detecting interference images would not appear to be sufficient to constitute a tangible result, since the outcome of the detecting step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. As such, the subject matter of the claims is not patent eligible.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1- are rejected under 35 U.S.C. 103(a) as being unpatentable over Cartwright et al. (cited in Applicant's IDS) in view of Swanson et al (US 5,465,147).

With regards to independent claims 1 and 19, Cartwright et al (Cartwright hereinafter) show femtosecond interferometry analysis for internal semiconductor devices with at least one light source for emitting a monochromatic light beam having a wavelength (930 nm) for which the material of the semiconductor component is at least partially transparent, wherein the light beam is split (beam splitter) into a reference beam and a sample beam, the sample beam is directed towards the semiconductor component and, with the help of a detection system, the images produced by interference of the light beam reflected by the semiconductor component

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with the reflected reference beam are recorded for a two-dimensional illustration (Fig. 2.) of certain internal physical properties of the semiconductor component, wherein the sample beam is directed at the backside of the semiconductor component to be tested and reflected at its topside, and at least two interference images (Fig. 2.) are detected in temporal sequence under different states of stress of the semiconductor component.

Cartwright does not expressly state the coherence length of the light source, however it is within the skill level of an artisan and taught by Swanson that the coherence length of the source should be short relative to the thickness of the substrate in order to obtain interference images created by light reflecting from internal layers of the semiconductor. Thus the coherence length should be less than the optical pathlength of the sample being measured, namely $2L_n$. Please see Swanson's Abstract.

With regards to claims 2 and 20, it is well known to adjust the size of the beam.

With regards to claim 3, it is well known to store the images for later use.

With regards to claims 4-6, Cartwright shows that there is external stress and it is within the knowledge of a skilled artisan to use laser (heat) pulses to induce stress.

With regards to claim 7, Cartwright shows that several images are taken thus it would be inherent that several beams are emitted.

With regards to claims 8 and 9, although Cartwright does not expressly state so, the stressed image is not taken at a random time therefore the claim is met.

With regards to claim 10, Cartwright shows the sample is a semiconductor and polishing (chemical or mechanical polishing) is a common manufacturing process of semiconductors and furthermore, a skilled artisan would recognize that the surface must reflect the majority of the incident light and polishing is well known to enhance reflectivity...

With regards to claims 11, 13, 14, 23-25 the use of two or more polarized light or different frequencies and the use of separate detectors for each polarized light or frequency is well known in the use of interferometers for improving the quality of the signal by eliminating nonlinearities and ambient influences in the measured signal. At the time of the invention, one of ordinary skill in the art would have used polarized light or dual frequencies or a combination of both with respective detectors in order to improve the accuracy of the measured signal.

With regards to claims 12, 29, automatic activation of the system is well known and at the time of the invention, one of ordinary skill would have automated the detection process with the emission of the light in order to minimize power usage, reduce wear, and optimize the use of the components.

With regards to claim 15 and 16, the use of an ideal sample or true reference mirror is well known and it would have been obvious to properly align the overlapping (interfering) beams for proper interference. In addition, automating the image processing is well known and involves only routine skill in the art.

With regards to claim 21, the stressing device is connected with a device for controlling the light source.

With regards to claim 22, see delay stage.

With regards to claims 26 and 34, see beam expander

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With regards to claim 27, attenuator are well known and one of ordinary skill in the art would have used an attenuator in order to match the intensity of the measurement beam with the reference beam in order that one beam does not overpower the other beam.

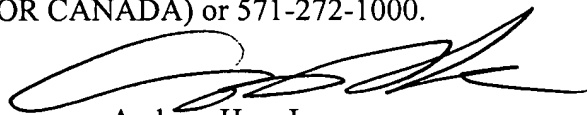
With regards to claims 28 and 33, it is well known to provide adjustments to optical components in order properly align them.

With regards to claims 31-36, the detection device includes a CCD camera.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley Jr. can be reached on 571-272-2800 ext 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Andrew Hwa Lee
Primary Examiner
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